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Producing Birdsfoot Trefoil Seed

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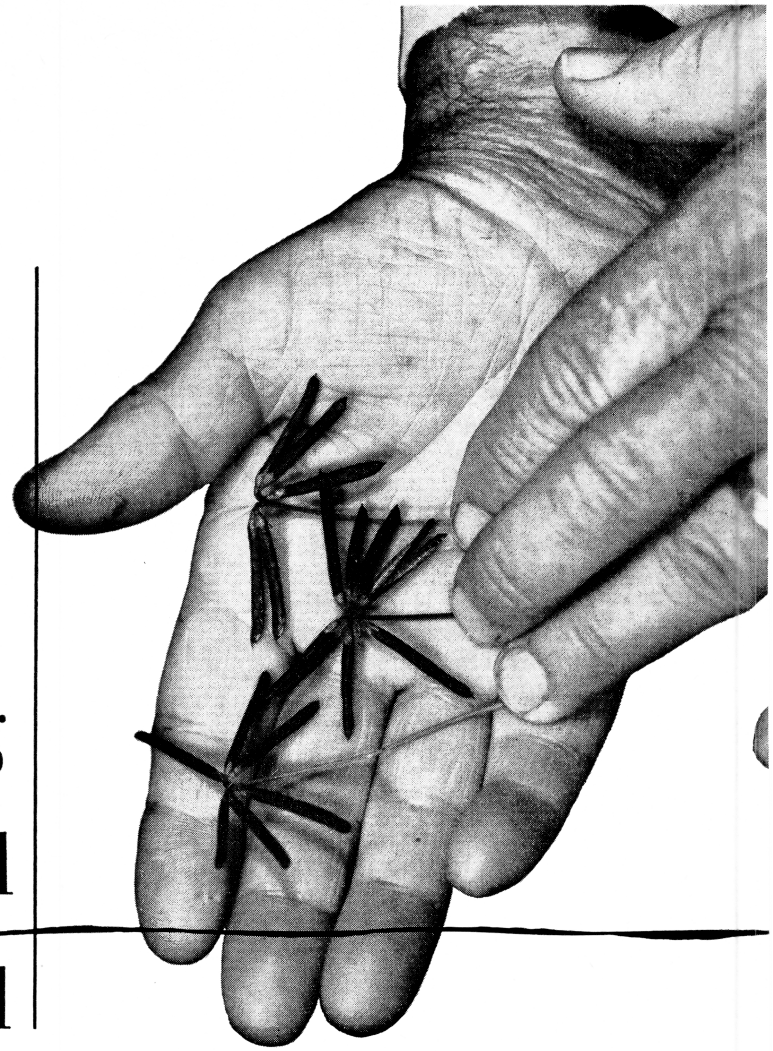

Supplies of birdsfoot trefoil seed haven't met the demand in Iowa. Seed is scarce and relatively high priced. Seed production can be profitable for those willing to take the precautions necessary for good seed yields.

by H. E. Thompson and D. S. Metcalfe

NO OTHER pasture legume now available equals birdsfoot trefoil in its duration and ability to withstand continuous grazing. It has a high feeding value and palatability. Yet, acreage in Iowa is limited.

Seed Is Scarce

Seed scarcity and high prices for seed are two of the primary bottlenecks that tend to limit acreage in Iowa. Another factor is that trefoil is relatively slow in getting established. This is more than offset, however, by the many years of grazing you can expect from it once established.

Seed supplies of the Empire strain coming from New York haven't met the demand in Iowa. Seed yields produced in Iowa have generally been low.

Why Low Seed Yields?

Several factors have been responsible for the relatively low trefoil seed yields. They include poor stands, too much weed competition, clipping or grazing in the spring, poor pollination, injurious insects, harvesting when seed pods are too ripe, poor harvesting methods and unfavorable weather conditions. We can't control the weather, but we can do something about most of the other factors that tend to limit trefoil seed production.

Seed yields from small hand-harvested plots with no seed loss have been as high as 500 pounds per acre. Field-harvested yields,

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on the other hand, often have been around 50 to 100 pounds of seed per acre.

What Can Be Done . . .

Good stands of birdsfoot trefoil are essential for high seed yields. Thin stands usually are weedy and may result in poor seed quality. And we know there have been stand failures of birdsfoot trefoil under conditions in which other hay and pasture legumes have succeeded. Birdsfoot trefoil seedlings are poor competitors. They won't stand extensive competition from a companion crop, weeds or other grasses and legumes.

The July issue of IOWA FARM SCIENCE will contain an article with more specific and detailed information and suggestions on establishing and using birdsfoot trefoil. In this article, we want to deal primarily with trefoil seed production.

Use First Crop for Seed

Alfalfa and red clover seed yields usually are highest when produced from the second rather than the first crop. Trefoil is different. You'll get highest seed yields from the first growth. Mowing or grazing trefoil in the spring greatly reduces seed yields.

Table 1 shows trefoil seed yields, 1949-52, both when the trefoil was clipped at several different dates and when it wasn't clipped in the spring. Notice how spring clipping drastically cut seed yields. Even the May 20 clipping reduced seed yields by 50 percent. Spring grazing may not decrease yields as much as clipping. If you do graze trefoil in the spring, remove the livestock early—about May 10—if you don't want the seed yield to be reduced.

Early clusters of flowers set more pods per cluster than those formed later in the season. The early pods also contain more seed than those formed later. It's this combination of more pods and more seed per pod that's the reason for the highest seed yields from the first blooms.

Trefoil and Grass . . .

Empire or Empire-type trefoil has a semi-prostrate or low-growing growth habit and lodges badly when grown alone. And, of course, when plants lodge, the seed yields are reduced. When trefoil is grown with a grass, the plants are held up, and lodging is reduced. Table 2 indicates how seed yields are higher when trefoil is grown with a grass than when grown alone.

Seed yields were higher when trefoil was grown with Kentucky bluegrass than with orchardgrass or timothy. We also found less lodging with Kentucky bluegrass than with orchardgrass or timothy.

Seeding a grass with the trefoil not only increased seed yields, but also made it easier to harvest the seed. At present, we don't recommend seeding timothy with trefoil to be harvested for seed; it's difficult to separate timothy seed from trefoil seed.

Insect Problems . . .

Like other forage legumes, trefoil needs bees for cross pollination. Trefoil is attractive to bees, and both honeybees and wild bees do an effective job of pollination. Where there are no colonies of bees near by, it's desirable to have some bees brought in while the trefoil is in bloom or to have them left in or near the trefoil field all season. Two colonies of bees per acre are adequate under most conditions.

Injurious insects may reduce seed yields in some seasons. Severe insect infestations have caused complete seed failures. The major injurious insects are Lygus bugs, alfalfa plant bugs, rapid plant bugs and leaf hoppers.

You can control these insects by spraying with 1 pound of DDT per acre or with 1½ pounds of toxaphene per acre. As a general rule, spray the plants just as they begin to bloom if insect control is needed. If the insect infestation is severe, it may be necessary to spray earlier in the season.

Should you find it necessary to spray *after* the plants are in bloom, use toxaphene at the rate of 1½ pounds per acre. Toxaphene isn't so injurious to bees as

TABLE 1. Seed Yields of Birdsfoot Trefoil Clipped at Dates Shown, Ames, Iowa.

Treatment	Seed yields in lbs. per acre				
	1949	1950	1951	1952	Av.
Unclipped	59.3	136.8	122.4	122.3	110.2
Clipped May 20	....	....	38.8	72.4	55.6*
Clipped June 1	35.7	27.7	0	13.8	19.3
Clipped June 10	38.8	30.9	0	0	17.4
Clipped June 20	8.2	0	0	0	2.1

*Average of only 2 years.

TABLE 2. Seed Yields of Birdsfoot Trefoil Seeded Alone and in Association with Kentucky Bluegrass, Orchardgrass and Timothy, Ames, Iowa.

Planting mixtures	Seed yields in lbs. per acre			
	1952	1953	1954	Av.
Birdsfoot trefoil, alone	110.4	32.2	152.1	98.2
Birdsfoot trefoil, Kentucky bluegrass	166.5	78.9	240.1	161.8
Birdsfoot trefoil, Orchardgrass	145.3	64.3	191.9	133.8
Birdsfoot trefoil, Timothy	129.5	42.4	177.8	119.9

is DDT. Another tip: If you spray after flowering has started, spray early in the morning before the bees get into the field or late in the evening after they've left.

Forage that has been sprayed with DDT or toxaphene should not be fed to dairy cattle.

Time to Harvest . . .

Birdsfoot trefoil doesn't flower uniformly. You may find flowers as well as green, brown, black or shattered pods on a plant at the same time. This makes it hard to decide just when to harvest.

The big problem is that the pods break open and shatter seed soon after they're ripe. But the pods usually don't shatter until they're dark brown or black.

Iowa State College tests in 1952 and 1953 indicated that seed harvested when the pods were light brown was fully developed and just as high in germination as trefoil seed harvested when the pods were dark brown or black. And the light brown pods don't shatter as easily as the more mature dark brown or black pods.

The best time to harvest trefoil for seed is when the majority of the seed pods are light brown. This will often be about 25 to 30 days after blooming.

If seed is harvested at earlier stages, the moisture content of the seed is too high for safe storage.

After harvesting, spread the seed on a tight floor or canvas to a depth of 3 to 4 inches. Stir the seed with a garden rake at least twice a day for 4 or 5 days. An electric fan set to blow over the seed circulates the air and hastens drying. Trefoil seed can be dried commercially, but the temperature must be kept below 100° F. or the germination may be lowered.

Trefoil seed pods are fairly tough and don't shatter readily when the relative humidity is above 35 percent. You can't control the humidity, but your shattering losses may be greatly reduced if you harvest on a day when the humidity is above 35 percent.

Harvesting Methods . . .

Several methods have been used successfully in harvesting trefoil seed. When it was first harvested in Iowa, the common practice was to windrow it and let it dry. Then it was combined like red clover. Usually most of the seed is lost by shattering with this method when relative humidity is under 35 percent.

The round baler also has been used—with the idea of conserving the feeding value of the forage and reducing shattering losses at the same time. Trefoil is still leafy and of high feed value when the seed is ready for harvest. With this method, the crop is placed in round bales after it has wilted in the windrow. After the bales are dry they must be cut open and fed into the combine.

Two disadvantages of this method: It requires more hand labor than other methods. The forage may heat and lower seed germination if the forage contains too much moisture when baled.

Trefoil seed has been combined direct. Little seed is lost by this method. But direct combining is a slow and tedious job and can be used only for small acreages.

It seems that the most desirable method at this time is to cut the trefoil, windrow immediately and combine about 4 to 8 hours later —depending on drying conditions.

If equipment is available, it's best to cut and windrow at the same time to minimize shattering losses. You can do a good job, for example, with a 5-foot cutter bar and a center-drop windrower. Small and uniform windrows are more easily combined than large windrows.

With this method, the trefoil won't be dry in 4 to 8 hours, but it will be wilted enough to go through the combine easier than if combined direct. Even on a hot dry day the humidity will be fairly high in a green windrow so that shattering losses won't be excessive.

Handled by this method, many of the trefoil leaves are still on the stems so that much of the forage feed value can be saved by baling soon after the crop has gone through the combine.

Defoliants . . .

There are a number of chemicals on the market called defoliants or desiccants. When sprayed on growing plants, they act like an artificial frost and dry the leaves and other top growth without killing the plant. Properly applied desiccants could aid in direct combining. Some of the desiccants used in our experimental harvesting trials for the last 2 years include Endothal, Dinitro and Dow defoliant.

Though such desiccants show promise, we can't make recommendations for their use until additional work has been done. Cost per acre also would be relatively high at present prices.

Seed Cleaning . . .

Trefoil seed must be cleaned after harvesting. And, even with good equipment, the job isn't easy. It's advisable to take the seed to a commercial seed cleaning establishment that has the right equipment to do this job. Equipment needed for a satisfactory job includes a good fanning mill, gravity mill and rice mill.

Seed Profitable . . .

To increase the use of birdsfoot trefoil as a permanent pasture legume, there must be more and lower-cost seed available. Since trefoil is scarce, its production can be profitable for those willing to take the precautions necessary to get good seed yields.

Here, in summary, are the main factors involved in producing profitable seed yields. Refer to the main part of the article for more specific details.

- Establish a good stand in a field relatively free from weeds.
- Grow trefoil with a grass—preferably bluegrass.
- Don't clip or graze the seed fields in the spring.
- Control injurious insects.
- Have bees available for pollination.
- Harvest when most of the pods are light brown.
- Windrow immediately after cutting; combine 4 to 8 hours later.
- Be sure seed is dry before sacking and storing.
- Have seed cleaned commercially with adequate equipment.